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Agricultural Experiment Stations.

THE first of the Farmers' Bulletins issued from the Office of Experiment Stations after it had been established at Washington was entitled, "The What and Why of Agricultural Experiment Stations." This publication has been out of print for some time, and Bulletin No. 26, which has just been issued, is intended to supply its place and give a brief summary of the objects of the stations in the United States and their work as it is now conducted. Of course, in a pamphlet of sixteen pages it is difficult to present with any clearness anything more than the leading features of the system, but the work has been well done, and any careful reader of this bulletin can not only interpret correctly the general purposes for which the stations were established, but he can appreciate to some extent the magnitude of the enterprise and its prospective value.

These stations cost annually a million dollars, three-fourths of which amount comes from the national treasury, and yet this large sum involves the use of but thirty cents for every thousand dollars' worth of the agricultural production of the country. More than 550 persons are engaged in this work, and last year a total of 4,500,000 copies of more than 450 different publications were distributed. There is some disposition, especially in the daily papers of our large cities, to criticise the work done at these experiment stations, but when it is remembered that the first one in the world was established less than fifty years ago; that the first one in this country was established only twenty years ago, and that stations are now in operation in every one of our states and territories, it is remarkable that so many of them are effectively manned and that they have already settled down upon lines of work which promise to be most broadly useful. They serve as bureaus of information to which farmers can turn for advice on matters of practical interest in their calling. They have helped to introduce improved processes, new crops, new varieties of live stock and new agricultural industries. They have been of great assistance in improving the quality and guaranteeing the purity of fertilizers and foods, and they are beginning to do the same work for seeds. They have given important help to the farmer against the attacks of insects and diseases which injure his crops and his animals. Best of all, they have held to the primary purpose of making tests and experiments from which to deduce scientific principles to be used as the basis of agricultural practice.

It is in the strict line of scientific research that these stations will ultimately do their best work, but it is just here where it seems obscure and absurd to so-called practical men. The experiment station is not a model farm or a money-making farm, but a field of investigation. The ordinary field-work here is not to raise crops, but to ascertain principles, and the successful farmer who sees in this work wide departures from what he considers the best practice too often concludes that the man of science is a dreamer, without any vital connection with the every-day busy world. But the fact is that the apparent failures in the field-work are quite as important as the apparent successes in furnishing data for comparison and study. These labors in the experiment stations are well compared in this bulletin to those of the chemist or the microscopist, or the electrician, whom many large manufacturing establishments find it profitable to keep constantly employed. These men of science ruin much valuable material, they work for months without any apparent result or without bringing a dollar into the treasury of the manufacturer, but they are learning principles, and some day these will lead to the discovery of some process which will give their employer the advantage over his competitors and much more than pay for all their labor has cost. Of course, there is always the risk of failure, but experience has shown that it pays in the arts to employ talents of scientific men. In these stations the Government undertakes to do for the farmer just what the manufacturers are doing for themselves. This work must be judged, just as other expert work is judged, by its final result after years of experience.

But while the work in the stations cannot be too rigidly scientific, it is to be noted that according to the law the bulletins are to be printed for the farmers. It is worth saying, that sometimes these bulletins contain scientific discussions, local floras and other matters which more properly belong to the journals of learned societies. It is bewildering and discouraging for a farmer to receive a bulletin which is beyond his comprehension, or treats of subjects only remotely related to his calling, and, therefore, it should be the aim of the stations to publish for circulation among farmers and fruit-growers only such matter as has direct agricultural and horticultural value.

We have also observed that experimenters sometimes publish their field-notes instead of results and generalizations from their work. Of course, when horticulturists make tests of varieties and do similar work, it is necessary that they should take accurate notes from day to day. But these notes are for their own study and not for the public. The farmer or gardener wants general conclusions plainly set forth, and not tables which must be studied long before they mean anything. Now and then an experimenter imagines that columns of figures and statistics are satisfactory scientific work. Of course, the experimenter needs such figures for his own study, but what is of real value in his work is expressed in his final judgment, based on all the data he has collected. It is usually a mistake to publish these figures in detail. They are for the experimenter alone, and after all they are usually but a part of what he has gleaned from a long and intimate acquaintance with his subject, and he must be familiar with all its phases to give the highest value to his final generalizations.

It is not our present purpose, however, to criticise the conduct of the stations, but rather to invite attention to this bulletin, and to suggest to all persons who feel the need of special information on any points in horticultural or agricultural practice to apply to the station in their respective states. It is the privilege of the people to present their own experience and ask for direct, personal aid; and such interchange establishes a living connection between the farms and gardens of the country and the institutions

which have been founded for their benefit. Knowledge—technical knowledge—is needed more and more as the struggle for existence becomes more complex and more strenuous. The fruit-grower, the market-gardener, the dairyman, the general farmer, who secures any return for his labor beyond the mere necessities of life, achieves this only by an intelligent adaptation of the teachings of science and experience to his special case. He must study for himself, and he needs all the help he can get from experts whose lives are devoted to the solution of the problems of agriculture in its broadest meaning.

Observations in California Forests.

THERE is so much to see in any forest tract that it takes a long time for an observer to reach the point when the minute daily life of the region becomes familiar. I had never given any thought to this matter until it happened that we camped for the second time in the interesting part of the Sierras along the south Yuba, by the famous old Dutch Flat stage road near the snow-sheds in the Cisco region. The place has a neglected aspect, because large portions of the district are overpastured and nearly all the valuable timber has been cut off. In fact, no one can understand the country without some knowledge of its history. When the stage road was built across, in the early sixties, it became one of the great routes of travel to Nevada. Thousands of vehicles passed over it every year, and towns of considerable size grew up only a few miles apart. The road was kept sprinkled from end to end, and was, in brief, one of those great, but now forgotten, arteries of the picturesque commerce of the mining period. A great mountain river foams down the bottom of a vast gorge in the everlasting granite. The portion of the gorge to which these notes relate is at an elevation of about six thousand feet. The sides of the gorge are fully fifteen hundred feet higher, and from crest to crest across our camp, as the eagle flies, the distance is not less than three miles. The general aspect of the country from any elevation is that of great and lonely desolation. Over naked granite cliffs rise the snow peaks under the blue Sierra skies. But there was a time when the whole gorge, excepting the more abrupt granite points, was clothed in forests of Pinus ponderosa, Abies concolor and other superb conifers. The enormous demands made for the towns along the stage road, for the construction of the railroad and for the snow-sheds, and the frequent forest fires have laid the district waste. Once there were saw-mills, cattle-yards, large hotels and stage stations where our camp of this year stood, and more than three thousand people, it is said, lived along a mile of the rushing mountain river.

The first impression one obtains of this wilderness is that its usefulness has perished; that there cannot be any more forest here; that the wasting soil is drifting slowly from the rocks into the bottom of the gorge; that even lesser forms of vegetation will little by little disappear, and the scant pasturage become even scantier. In this spirit, therefore, shocked with the evidence of waste and slaughter, and profoundly discouraged, I began to consider whether the reproductive powers of the forest were still sufficient, under proper conditions, to restore it to its former usefulness. The results of my observations were in some respects surprising, although based upon simple facts which should be known to every woodsman.

The forest problems in this district, which is one of the highways along which cattle and sheep are driven into the fastnesses of the Sierras and back to the valleys, are assuredly as difficult and numerous as those of any other part of California. If the leading species will reproduce themselves here, or if some species are gaining foothold, or if a little care and attention would enable the young trees to overcome all obstacles, it seems certain that immense areas in the Sierras elsewhere also could be reforested. The enemies of the forest here are first the sheep, second the cattle, third the old trees which die, and, felled by the winter storms, break down hundreds of the younger trees; lastly, the fires.

In order to gain some idea of the powers of reproduction possessed by the leading conifers, I climbed a mass of almost naked granite, covering, perhaps, twenty acres of ground. Its seemingly barren summit was three hundred yards in a direct line from any specimen of Pinus ponderosa, and far above it. Nevertheless, in minute crevices and pitted hollows the size of a thimble, where a few grains of sand had drifted, there were young trees of P. ponderosa—last winter's seedlings. In one crevice eighteen inches long, and too narrow for my knife-blade to enter, nine such tiny Pines were growing. The seeds must have caught in small inequalities of the surface and thrust their roots downward in a crack made by the frost. The seeding of this barren spot must have come from cones hurricane-driven, or from some stunted tree since torn from the rocks. All around this granite crest, in every hollow, Pine-trees were beginning to root. Here and there some had perished, but they were slowly taking possession. As the soil became better, and where there was a barrowful of sand instead of a handful, Abies concolor and Libocedrus decurrens mingled with the Pines. While no one would expect to see a forest of merchantable timber produced upon these granite walls, the enormous reproductive ability of the Pines needs no further illustration.

The valleys along the river contain deep and rich beds of soil and leaf-mold in perfect condition for carrying immense timber growth. Upon one-half acre of such soil I counted thirty-three stumps of Pinus Lambertiana, P. ponderosa and Abies concolor. The largest stump was about eight feet in diameter. Even here small trees are continually reproduced every spring, to be trampled down every summer, for a few stunted trees in the rocks still scatter their seeds over the desolated nook. I am convinced that over this entire district, from the lowest point in the gorge to the highest pinnacle of rocks, Nature still plants enough seedlings yearly to produce as many seedling trees as the district will carry, but only one tree in a thousand ever arrives at maturity.

Over all this region there are very beautiful groves of second-growth timber, from twenty to forty years old. The trouble with most of these is that they are often broken down in windrows by the fall of dead trees, or by masses of snow. Sometimes one sees little groves of several acres, in the rich flats, which are almost perfect, but the need of the axe is in most cases very great. A tree which has grown upright for five or six feet, if then broken down, the leader turning at right angles or bending to the ground, can never again make a shapely top. Some of these second-growth groves make one's heart ache, they are so forlorn. One wishes to take an axe and spend a week there from dawn to dark, cutting out the distorted trees so as to give the rest a chance. There are more than enough straight trees on each acre of such land to make a prosperous forest. The way these windrows fall is difficult to describe without the aid of a photograph. In one case which I studied, a dry Fir-tree, perhaps a hundred feet high and two feet in diameter at the base—a tree which could easily have been removed by a forester, without doing any injury to the young groves—had slowly sagged downward, year after year, until last winter it came over upon the young trees, breaking down a number of the largest which were from twenty to fifty feet high; these, of course, brought down still others, bending them so that in all about seventy-five trees of over five feet in height were practically destroyed by the weight of the bending trees and of the snow, which in this district usually lies fifteen feet deep on the level.

Agricultural value, except for temporary pasture, this region does not possess. It can never be settled with farmers, nor with miners, for it is far above the farming belt and the mineral belt of California. It will never again be on a route of travel, unless civilization goes back to the stage coach. If it could be reforested, the fish and game supply

would be even better than it is now, and it would soon support a considerable population and be of direct advantage to the state. It is a spot which is typical of the dullest condition of the high Sierras, and here, or in some similar place, the National Government could well afford to set apart a square mile of land for a forestry station, in order to prepare for the forests of the future. The suggestion of such a forestry experiment in the Sierras and a similar one in the Coast Range, upon land that is definitely unagricultural, has been made before now, and it should be kept before our law-makers, Congress after Congress, until definite results are reached.

Niles, Calif. *Charles Howard Shinn.*

Foreign Correspondence.

London Letter.

Gerbera Jamesoni.—This pretty Composite perennial was introduced from south Africa seven years ago, and for several years it was grown in pots in a greenhouse. It has, however, since proved to be quite hardy in a south border, and in some gardens, notably the botanic garden at Cambridge, it makes a beautiful display of flowers all through the summer. The number of flowers open at once upon a single plant has been as many as fifteen, and as each flower is over four inches across and colored bright vermilion the effect is exceptionally good. The plant has a tuberous root-stock, stalked pinnatifid leaves about a foot long, and erect scapes from fifteen to thirty inches long, nodding at the apex, and bearing a single flower-head composed of a disk and a radiating single row of narrow petals. They last a long time. At Cambridge the leaves are said to be two feet high and the scapes three feet. I do not suppose that the plant would stand severe frost, but it might be grown where the Belladonna Lily would live.

Polygonum compactum.—There are two large beds of this plant in a conspicuous place on the lawns at Kew, and for the past month or more they have been very attractive. The plant grows to a height of about eighteen inches, produces many shoots, clothed with cordate leaves four inches long, bright green, with red petioles. The flowers, which are crowded on erect terminal and axillary panicles, are whitish, tinged with rose, and in the effect they produce they resemble somewhat the common Spiræa (Astilbe) Japonica. Although long grown at Kew, this really handsome Polygonum has never had an opportunity till this year of proving its worth as a garden-plant. It is a perennial, and is as easily propagated from cuttings, division of the root-stock or seeds as Polygonums generally are. It is a native of Japan and is quite hardy here.

Polygonum lanigerum.—This is a large and handsome-leaved annual species of recent introduction (I believe it was first cultivated at St. Petersburg in 1890), and is a most suitable plant for a position in the herbaceous garden or to fill a bed on a lawn. It has stout semi-procumbent stems, a single plant forming in a few weeks a mass six feet through and four feet high. The leaves are stalked, lanceolate, about a foot long and four inches wide, elegantly curved into a half-circle and covered with a silvery tomentum, as in the Cape Silver-tree (Leucodendron). The plant at Kew has not yet flowered, but it promises to make a good display soon, and as the flowers are said to be red, and the succeeding nuts black, it ought to prove strikingly handsome when at its best. It is well worth attention for its foliage alone by any horticulturist who can appreciate a good lawn plant. It appears to be found wild in all parts of the world except Europe.

Polygonum orientale is one of the oldest of the exotic species that are sufficiently ornamental for the garden, but it is not often used with such effect as at Kew this year. Here it is a handsome feature of the herbaceous border, as well as in a pair of round beds on a lawn. In the latter position a rich soil has produced stems fully ten feet high and as thick as a man's wrist at the base; the leaves are correspondingly large, but there are not so many flowers as upon the plants grown in poorer soil. These are six feet high and crowded with elegant, drooping tail-like racemes of coral-red flowers. The species is an annual and is of the easiest possible cultivation. It is just one of those handsome, good-natured plants which fit many a corner in the outdoor garden, but are often overlooked. P. orientale is an eastern plant, ranging from the Himalaya to China and Japan. There is a white-flowered variety of it.

Impatiens amphorata.—This is a rival to the old Impatiens Roylei, which is naturalized in England and which is at the same time one of the most commonly grown plants in cottagers' gardens. I. amphorata was introduced to Kew last year from the Himalayas. It ripened plenty of seeds, which were sown in beds and in the wild garden, and from these there are now handsome bush-like specimens four feet through, with slender upright stems, ovate leaves two or three inches long and a great number of flowers about half as large as those of I. Roylei, and colored soft-rose, with the upper segment white and a blotch of yellow in the throat. It is a good plant for the herbaceous border, as it flowers freely and continuously all through the summer. If I. Roylei is not common in the United States it is worth being made so.

Physalis Francheti.—This beautiful border plant is charming in every character, the stems healthy, the foliage vigorous and of a rich green, and the Chinese lantern-like fruits nearly three inches in diameter and of the brightest orange-red color. It is a plant for the million, as it is perennial and as hardy, apparently, as the old Physalis Alkekengi. It will be remembered that P. Francheti was introduced last year by Messrs. Veitch & Sons, Chelsea, and that it was named by Dr. Masters in compliment to Professor Franchet, the well-known French botanist, to whom we are indebted for recognizing this as a distinct and promising garden-plant. It is worth growing for the sake of its fruit in the autumn, which, if cut with the stems, would be popular for floral decorations.

Althæa ficifolia.—I believe I mentioned this plant about a year ago as a good subject for the herbaceous border. It is exceptionally fine again at Kew, forming a large cluster of stems six feet high, clothed to the base with rugose fig-shaped leaves a foot in diameter, and bearing axillary flowers four inches across of a clear primrose-yellow color. It is a near ally of the Hollyhock, A. rosea, but differs from that in its looser habit of growth and in the digitately lobed character of its leaves. It is perennial, I believe, but it ripens seeds freely, from which flowering plants can be raised in one year. It might be a good plant to cross with the garden Hollyhock, with a view to strengthening the latter against the devastating disease, Puccinea malvacearum, which has driven the Hollyhock out of cultivation in many districts.

Helianthus rigidus, var. Miss Mellish.—The Sunflowers are beautiful with us in September and October, and one of the best of them is that here named, which was first brought into notice here about three years ago. It differs from the type in having larger flowers of a purer golden yellow color, while in height, five feet, it is exactly right for beds. A large circular bed, twenty feet across, filled entirely with this plant and situated on the sunny side of a tall black green yew hedge, is a magnificent picture here now. The plant is easily multiplied by division of the root-stock or from cuttings. It is already very popular in the garden here. A few groups of such plants as this, the big Ox-eye, Chrysanthemum, purple Asters and Kniphofias, if planted with taste in the pinetum, have a wonderfully brightening effect upon that otherwise usually sombre part of the garden.

Bedding Begonias.—The craze for the big-flowered tuberous Begonia has crowded out of notice some of the pretty little sorts which used to find favor. There is, for instance, no Begonia more deserving of a place among summer bedding plants than the old B. Worthiana, a sport from B. Boliviensis. It has been beautiful all through the summer

at Kew, the stems, less than a foot in height, being crowded with elegant narrow leaves and bright red drooping flowers. The semperflorens race is also valuable for summer bedding. They keep dwarf and flower freely when grown out-of-doors in full sunshine, and as there are now many varieties they are sufficient in themselves to furnish a "design." The best of those used at Kew are: rosea, with pale blush-pink flowers; Crimson Gem, with crimson-purple tipped leaves and deep blood-red flowers; and the type which has glossy green leaves and bright red flowers. They are raised from spring-struck cuttings.

London. *W. Watson.*

New or Little-known Plants.

Rhus Michauxii.

THIS extremely rare, little-known and long lost shrub, was discovered at the end of the last century by the French botanist Michaux, in western North Carolina, in what is now Mecklenburg County. Later it was found by Lyon in North Carolina in fruit, and in flower by Boikin, and by Le Conte in Georgia; and recently it has been rediscovered by Mr. W. W. Ashe, of the Geological Survey of North Carolina, at Farmington, Davie County, in western North Carolina; and by Mr. F. B. Boynton and Mr. F. L. Olmsted, Jr., it was introduced last summer into Mr. Vanderbilt's Arboretum at Biltmore, whence it has been sent to the Arnold Arboretum. By Messrs. Boynton and Olmsted, who found three clumps of this plant, with ripe fruit, Rhus Michauxii (see illustration on page 405 of this issue) is described as a shrub with erect stems from one to three feet in height, spreading extensively by underground stolons. The stems are stout, and, like the petioles, the lower surface of the leaflets and the panicles of flowers and fruit are villose-pubescent. The leaves are deciduous, from twelve to fourteen inches in length, with about eleven leaflets; these are oval or oblong, acute, gradually narrowed or rounded and slightly cordate at the base, coarsely crenately serrate, dark dull green on the upper surface, which is pilose along the conspicuous veins, pale on the lower surface, about two and a half inches long, an inch and a half wide, and sessile or very short-stalked, with the exception of the terminal leaflet, which is borne on a winged petiolule three-quarters of an inch in length. The panicles of flowers, which were collected by both Boikin and Le Conte, are terminal, thyrsoid, nearly sessile, about six inches long and nearly three inches broad. The calyx is covered with cinereous tomentum and is divided into oblong-triangular lobes, rather shorter than the oblong rounded pale yellow petals. The fruit is nearly globose, about an eighth of an inch in diameter, bright scarlet, and clothed with close silky pubescence.

The juices of Rhus Michauxii turn black in drying, like those of several of the poisonous species of Rhus, and Pursh, on the testimony of Lyon, who suffered seriously from it, and Torrey and Gray describe the plant as exceedingly poisonous, while Curtis denies its poisonous properties. From my limited experience with a partly dried specimen I am inclined to believe that it is the most poisonous of the North American species.

Five years before the publication of Rhus pumila in Michaux's *Flora* the name was used by Meeburgh in 1798 (*Pl. Select. Icon. Pict.*, t. 14) for another plant, which is probably not a Rhus at all, so that the name is not available for Michaux's plant, for which I propose the name of its discoverer. *C. S. S.*

Plant Notes.

The Viburnums.

TWO weeks ago we spoke of the value of the Cranberry, Viburnum Opulus, as an ornamental plant. But it is not more beautiful or valuable than many other species of this genus, which is represented in North America by several of the handsomest shrubs of our forest glades.

Viburnum Lentago and Viburnum prunifolium, which often grow to the size of small trees, are beautiful with their lustrous leaves, their broad flat clusters of flowers and brilliant fruit; this in ripening changes from green to pink and then to a deep blue, berries of these three colors being often seen together in the same cluster. These are both hardy, fast-growing, vigorous and attractive plants, equally well suited to decorate a lawn or the margin of a wood.

Viburnum cassinoides and Viburnum nudum, the first from northern and the second from southern swamps, are as beautiful in cultivation as any shrubs we are acquainted with. They both have thick opaque lustrous leaves, large clusters of pale yellow flowers and fruit, which in ripening turns bright pink and then deep blue. Viburnum dentatum and Viburnum Molle are vigorous plants with large, coarsely serrate, lustrous, membranaceous leaves and small bright blue fruit, which does not turn pink in ripening.

Viburnum acerifolium is a comparatively dwarf shrub with slender branches, three-lobed and three-ribbed leaves, in form not unlike those of some varieties of the Scarlet Maple, small clusters of flowers and dark blue or nearly black fruit. From the decorative point of view, its greatest value is found in its neat habit and the purple and dark red colors of its autumn foliage. Viburnum pubescens is a smaller and rarer plant than any of those we have already mentioned. It is distinguished for its excellent habit and the peculiar deep purple color its leaves assume late in the autumn. This autumn coloring of the leaves is the chief attraction of this Viburnum, but this is so great that it should find a place in every collection.

The most beautiful, perhaps, of all our Viburnums, the Hobble-bush, Viburnum lantanoides, is the only species that it is difficult to accustom to the conditions and surroundings of the garden. Like Viburnum Opulus, it produces large marginal, sterile white flowers surrounding the clusters of small fertile blossoms, but these sterile flowers are larger than those of the Cranberry-bush, and the whole inflorescence is larger and more beautiful. The large rounded leaves of the Hobble-bush are very handsome, and those of no other plant assume a more brilliant scarlet color in autumn. The fruit in ripening is bright red, but finally turns dark blue-black.

These are all species of eastern America, common inhabitants of the forest and the borders of swamps, fields and highways; but in the old world are several Viburnums that are hardly less beautiful than our American species. The Wayfaring-tree, Viburnum Lantana, of Europe, is one of the best foreign shrubs that have been transplanted into our shrubberies. The foliage is bold, vigorous and deep-colored. The flowers are produced in profusion, and the fruit, which is black and lustrous when fully ripe, at one time in the summer is bright red. Japan has already contributed to our gardens Viburnum tomentosum, Viburnum Sieboldii and Viburnum dilatatum—all decorative plants of the first class; but in Japan are several other Viburnums which will probably prove as desirable ornaments to our gardens as any of these. Among them are Viburnum furcatum, the Japanese representative of our Hobble-bush, although a larger and more beautiful plant, common in the forests of Hokkaido, and the scarlet-fruited Viburnum Wrightii, a shrub which reminds Americans that their compatriot, Charles Wright, collected plants on the shores of Volcano Bay as well as on the deserts of our south-western boundary.

Several other Asiatic species now known to science, but not yet introduced into our gardens, may be expected to add variety and charm to northern shrubberies, but considering only the common and well-known species, and taking them altogether, the Viburnums form, perhaps, the most satisfactory group of the deciduous-leaved shrubs of our northern gardens. They are perfectly hardy; they are easily raised from seed and easily transplanted; they are exceptionally free from disease and the attacks of insects; they grow rapidly into shapely bushes, producing their flowers and fruit profusely, and in autumn the foliage of

several species assumes brilliant colors, and in planting a garden or park in the northern states, if our choice of material was confined to the species of a single genus, we should not hesitate to select the Viburnums.

Lonicera orientalis.—A correspondent writing to this journal several years ago (vol. ii., page 296) spoke of the small value of this shrub in comparison with several of the other bush Honeysuckles, especially the fine forms of Lonicera Tartarica and some western Asiatic species. To the beauty of this plant, however, about the first of September, when it is covered with its large black lustrous fruit, our correspondent hardly did justice, for at that period of the year it is certainly one of the most attractive shrubs of its class, holding in beauty its fruit, which ripens late and is black in color, for a long time after the berries of the Tartarian and Ruprecht's Honeysuckles have fallen to the ground or lost their brilliancy. L. orientalis, which is a native of the Orient from Asia Minor to Cashmere and the temperate Himalayas, becomes in this country a low-branched, round-topped, leafy bush of a good habit, and, therefore, well suited to stand by itself on the lawn or in the shrubbery. A good plant to associate with the Oriental Honeysuckle is the yellow-flowered Lonicera chrysantha of Amurland, northern China and Japan. This is a tall, stout, wide-spreading shrub with ample ovate-acuminate, conspicuously veined leaves, small pale yellow flowers raised on long slender peduncles, and light cherry-red lustrous fruit which ripens with that of L. orientalis and retains its beauty for several weeks. Cultivated for many years in the Arnold Arboretum at Boston, L. chrysantha has shown itself perfectly hardy there and in every way a desirable and useful shrub. The plants, like those of all the bush Honeysuckles, show considerable variation, and among several varieties cultivated in the Arboretum is one obtained from seeds gathered by Dr. Bretschneider on the mountains near Pekin. The fruit of this plant is nearly translucent, and is considered by many persons more beautiful than the fruit of Lonicera Ruprechtiana or of any of the other bush Honeysuckles in the collection.

Fig. 55.—Rhus Michauxii.—See page 404.

Saintpaulia ionantha. — This beautiful Gesneriad, a dwarf Gloxinia-like plant, deserves special mention among the new flowering plants. Its neat, compact habit and its time of flowering make it a valuable acquisition, indeed. The flowers are produced in cymes from the axils of the leaves on slender peduncles, four or more together. The color is a lovely lavender or pale blue, the anthers being golden-yellow. The corolla about three-fourths of an inch in diameter, irregularly five-cleft, almost flat, with a very short tube. The leaves are cordate, fleshy and hairy, on long, brittle petioles, deep green, and a very dark olive-green when mature. The plant is stemless and spreading, seldom more than six or eight inches high, and is very floriferous throughout the winter months. It will, perhaps, prove useful and interesting for hybridizing purposes, and will, undoubtedly, be improved upon by cultivation. April is a suitable month for sowing the seed, and as the plant grows rapidly, large-flowering specimens can be had in September or October. The seeds, which are very fine, should not be covered, but merely sown on the surface of the soil in a well-watered pot. They germinate in two weeks. The seedlings should be pricked off in a soil composed of equal parts loam, leaf-mold and sand as soon as possible. They will be ready for planting singly in two-inch pots about two months from sowing, after which they grow rapidly and must be repotted twice during the summer—first into three-inch, then into five-inch pots, which is a suitable size for flowering plants. A temperature of seventy-five degrees during the summer, and about seventy during the flowering season, is sufficient. The foliage should be sprayed frequently, and the roots also require abundant moisture. It is quite probable that this interesting plant can be increased by means of leaf-cuttings in the same way as the Gloxinia, as broken leaves always form little plants wherever they happen to fall.

Aconitum Fisheril. — This late-flowering Monkshood makes a very dwarf and compact plant, hardly a foot high, with large panicles of pale purplish-blue flowers. It remains in bloom for a considerable time, from September until late in the fall, and will grow in very dry and sunny positions. During the present dry season it is one of the few hardy herbaceous plants standing perfectly fresh and healthy, uninjured by sun and drought. The flowers are larger and of a paler color than those of the common Monkshood (A. Napellus), and the inflorescence is immense, considering the size of the plant. The ternate leaves are very thick and leathery and of a deep green color. The compact, floriferous habit of this plant makes it valuable for rockeries and select borders. All Monkshoods are, however, very poisonous, and the nearly related Delphiniums are far more desirable for small lawns and gardens.

Pleroma semidecandrum (Lasiandra macrantha).—This exceedingly beautiful plant of the Melastoma family is well suited for our American summers, as it will do well in the open air from May until October. The flowers measure four inches across and are produced in terminal cymes, one at a time. They are of a deep violet-blue color, and appear nearly all the year, more abundantly during the summer and early autumn months. The leaves are ovate, acuminate, dull green above, silvery beneath, on both sides covered with silky hairs. When grown in the full sunlight, if judiciously pruned, it will form a bushy plant or a slender-stemmed tree as beautiful for the conservatory as for the lawn. If planted out in a border in a greenhouse or conservatory and trained underneath the glass in the full sun it will form a strikingly beautiful object. It will do equally well in pots and flower more freely, although the flowers are never as large as they are on specimens planted out. When planted in the open border a partial rest is necessary to ripen the wood and to make sure of plenty of flowers. The best soil in this country for Lasiandras, as these plants are more generally called, is one composed of equal parts of rich fibrous loam and peat, with a liberal addition of sand. During the summer plenty of water should be given if the plants are grown in pots; in a border the plants can easily be overwatered. Cuttings of growing wood inserted singly in two-inch pots and placed in bottom-heat in a close frame root readily. The plants should be potted pretty firmly, and when established will do well under ordinary greenhouse treatment.

Cultural Department.

Late-blooming Hardy Herbaceous Plants.—II.

Phlox nelsonii is giving its usual autumnal bloom of small stemless pure white flowers in sheets, which are shown off by its dark green moss-like foliage. Physostegia Virginiana is showy with its dense heads of pink flowers, and forms a good border plant some three feet high; it is of spreading habit, yet easily kept in bounds. Tall masses of Pyrethrum uliginosum are now at their best with their lavish supply of pure white Marguerite-like flowers, admirably adapted for cutting purposes. The double Saponaria officinalis, the old-fashioned Bouncing Bet of New England farm yards, though weedy and not to be recommended for the flower border, is a desirable plant for naturalizing, and shows dense heads of pale and deep purplish-pink double flowers. Some of the deeper pink forms are quite effective and should be used more often where a showy plant is desirable in a permanent position.

Senecio pulcher, though it requires heavy winter covering, abundantly repays this care and is in constant bloom from August until hard frost, producing rich purplish magenta, aster-like flowers, each an inch and a half to two inches across and borne in showy flat clusters.

The Pilot Weeds and Prairie Docks, such as Silphium laciniatum, S. perfoliatum and S. terebinthianaceum, are now giving a profusion of bloom, all with showy light yellow flowers and all unusually varied and interesting in their foliage and habit of growth. Solidago rigida, S. sempervirens and S. Virgaaurea are among the best of the Golden-rods and form good border plants with bright golden yellow flowers. The first-named is the best, but unfortunately it is afflicted with a rust that must be contended with at its season of bloom. Statice Gmelenii still shows immense open heads of deep lilac blue flowers—a unique plant with peculiar strap-shaped foliage and a marvelous quantity of bloom.

Trollius Europeus, the Globe-flower, is once more in its element of temperature, and throws a constant succession of showy globular yellow flowers, as bright as they were in early spring. This is one of the finest plants to enliven the border in early summer and again in fall, and very choice for cutting. Stobæa purpurea now lifts up its broad candelabra-like head of rich deepest purple, spiny flowers, each three inches across. This is one of the most distinct of the Thistles, but its hardiness has not yet been proved. Anthemis tinctoria, now that the seed-vessels from the first crop of flowers have been removed, is sending up a second lot of bloom, and, though rather weedy, is very effective with its Marguerite-like dark lemon-yellow flowers. Ophiopogon Japonicus is throwing up spikes of small deep blue flowers. Sedum spectabile displays its broad flat heads of rich pink flowers; S. Sieboldii shows small dense clusters of red flowers, while S. maximum is producing heads of creamy white and pink flowers.

Hibiscus moschuetos is out of flower, but its crimson-eyed variety is giving quite an effective show of large creamy white, red-throated flowers; H. Californicus is especially showy with its broad trumpet-shaped, waxy petaled, creamy white flowers with deep carmine centres, and these flowers are from five to seven inches across. Single plants that have been established are producing from 100 to 150 blooms each, giving a most effective show to the flower border. Inula glandulosa continues to give its showy, light yellow, finely cut rayed flowers in abundance. Buphthalmum salicifolium is again at work, producing its bright yellow flowers of good form, and well adapted for cutting, and the dark rich purplish blue flowers of the Aconitum autumnale are at their best.

Campanula Carpathica and its white variety are striving to excel each other in sustaining their blooming season until hard frost, and they still are among the best border plants. C. Van Houttei has given many spikes of second bloom, and has been especially welcomed. Grindelia squarrosa is in perfection, forming a bush three feet high and two feet through, with plenty of showy clear yellow flowers with good centres.

Veronica longifolia, var. subsessilis, is throwing out numerous side branches and promises an abundant display of rich bloom for some weeks to come. Plumbago Larpentæ, with its broad sheets of deep blue flowers, is at its best, and Eryn-

gium alpinum is throwing up a second growth of its curiously formed and colored flower heads.

Echinacea purpurea is flowering as freely as it did six weeks ago, and E. angustifolia is giving a good quantity of showy, medium-sized flowers. Both of these are stately native plants. Rudbeckia speciosa still shows some bloom, while R. subtomentosa is at its best; immense branched heads of rich golden-yellow flowers, with purple, cone-like centres covering plants which grow to a height of three or four feet, are very effective. Scabiosa Caucasica is producing a great abundance of showy lavender-blue flowers with rich lavender centres which are eagerly sought for cutting.

The Sunflowers, from which at this time of the year we expect the richest effect, are not disappointing. Helianthus decapetalus is just passing by with its wealth of light lemon flowers. H. multiflorus has been for a full month giving a constant succession of large clear yellow flowers, four to five inches across, and borne on long stems well fitted for cutting. The double H. multiflorus has been in bloom since July and does not show any signs of abatement. H. mollis is one of the most desirable species, with its odd velvety foliage and handsomely formed light lemon-yellow flowers, each three inches or more in diameter. The tall H. orgyalis is just at its best, and H. Davisii shows immense heads of small golden-yellow flowers. H. trachæfolius and H. gros-serratus are two other coarse-growing forms, the first with yellow bloom and the second with orange-yellow and with a well-colored centre; and H. lætiflorus, with its showy, cup-shaped, semidouble golden-yellow flowers, is not quite past its flowering season and continues to be in demand for cut work.

This article is already too long, but it by no means completes the list of hardy herbaceous plants which for weeks will continue to keep our borders bright. The long spikes of Lythrums and Liatris, and the broad heads of rich purple flowers on the Vernonias, the red and white Centranthus, with Campanula grandiflora preparing for its second bloom, Daphne cneorum giving its third crop of fragrant pink flowers, Birds'-foot Violets, Alpine and Iceland Poppies, and Heuchera sanguinea, flowering as they do in spring, hybrid Phloxes still in full show, Gaillardia grandiflora still opening its broad flowers with their bands of orange and maroon as bright as ever, Helenium autumnale, Funkia lancifolia, Armerias of various kinds with flowers of lavender, red and deep pink—all these and more help to make the flower garden in the waning year as interesting to the real lover of plants as it is in any other season.

Reading, Mass. *J. Woodward Manning.*

Notes from the Washington Botanic Gardens.

Hunnemannia fumariæfolia.—If seeds of this beautiful Papaveraceous plant be sown now and wintered over in a cold frame, the plants will flower abundantly next season. This is one of the few plants common in our gardens which seem to revel in very hot weather. If set out in a sunny well-drained border it very soon attracts attention by its finely cut glaucous leaves and large Eschscholtzia-like flowers. It is a native of Mexico, presumably the coldest parts, as plants without protection have undergone zero weather without hurt; nevertheless, it is well worth taking a little extra care of in the way of winter protection. Its period of blooming is from midsummer till frost.

Caryopteris Mastacanthus.—The most attractive plant in the shrubbery at present in bloom is Caryopteris Mastacanthus. It is valuable for its period of blooming, when other things are, as a rule, looking rather seedy. The flowers are small, a goodly number of them springing from the axils of the leaves at the ends of the shoots. The color is violet-blue. At first sight the plant when in bloom is suggestive of a Vitex, to which genus it is closely allied. It is a native of China, so that in the northern states it will require protection during winter.

Solanum Wendlandii.—This plant has been tried out-of-doors here the past summer and it has flowered beautifully, but only during the last few weeks. It spent all the summer months in making long, stout growths. The plants were small when put out, but if larger ones had been tried I am inclined to think the flowering period would have been longer. In the northern states the proper place for it is in the greenhouse, trained up pillars or rafters, where it will make a display not easily surpassed in beauty. The flowers are very large for a Solanum, and bright lavender in color.

Vinca rosea.—The Madagascar Periwinkle has for several years been our handsomest bedding plant. From the day the plants are put out until cold weather they are never out of bloom. To have them in bloom at planting-out time the seeds are sown early in the season, say by the end of January; by the middle of May they will be starving and in flower in three-inch pots. I think the kinds look best when kept separate from each other. As every one knows, one has pink flowers, another white ones, and a third white flowers with a pink eye. The plants reach a height of about eighteen inches in good seasons, and they are very symmetrical.

Botanic Garden, Washington, D. C. *G. W. O.*

Cannas.

THE flowering season of these plants will soon be ended by frosts and the roots should be taken up at once. They should be allowed to dry a little and then be stored in boxes of dry sand, where the temperature will not fall below forty degrees. It is preferable to place them under the benches of the Carnation-house, or in a similar place rather than in a cellar, provided they are not exposed to the drying influence of hot-water pipes. The annual introduction of many new and improved varieties indicates the popularity of these plants, and this is partly due to their easy culture. The season of blooming can be lengthened if they are started indoors, but they will flower, although at a later date, if the tubers are planted in the open ground. If seeds are saved from the best varieties, and a batch of seedlings raised every year, a fair percentage of the plants will be found worthy of preservation, while there is always a chance of getting something good.

Cannas are easily hybridized, and insects usually work busily on them, so that if artificial impregnation is used for a direct cross between two varieties it is necessary to have some means of protecting them from insects.

To obtain strong plants from seed by planting-out time the seeds should be sown in January. Plenty of bottom-heat is necessary, as they are hard to germinate. If good bottom-heat is not obtainable, germination is greatly assisted by soaking the seeds in tepid water. They should be inserted singly in small pots filled with an open sandy compost. The plants should not be allowed to become pot-bound, for the roots are brittle and easily broken in shifting. To avoid any check when planting out, the plants ought to be well hardened off.

Tarrytown, N. Y. *William Scott.*

Forcing-house Notes.

THE first fires of the season were started in the forcing-houses here on September 29th. Although there was no danger of frost on that day, the houses were cold and damp. Plants for winter vegetables should never be chilled at this time of year, as a chill weakens their constitution, stunts their growth and renders them liable to diseases of all kinds. Plants for winter crops should be kept growing steadily now, and every unfavorable condition removed. Cucumbers and Melons were put in the beds last week, and the Tomatoes and Radishes are about to go in.

A study of the soils adapted to forcing different vegetables is of the first importance. It is not uncommon to see the same mixture used for several plants whose habit of growth and feeding are dissimilar. It is believed that the physical properties of the soil—that is, its proportion of gravel, sand, clay, silt and vegetable matter, which a suitable soil contains—exerts as great an influence on the ultimate success of the crop as the amount of plant-food which it can furnish, and that a mixture that is best for one plant is not the best for another in the forcing-houses. During the winter to come, Melons, Cucumbers, Tomatoes, Radishes and Lettuce will be grown in six distinct soils containing different proportions of the ingredients named above, in order to secure data for study and comparison.

Cornell University. *G. Harold Powell.*

Marantas.

THIS handsome genus of ornamental-leaved stove-plants should be represented in every collection. Whether arranged by themselves in groups or intermixed with other plants they never fail to make a pleasing effect. They thrive well in a warm stove with abundant atmospheric moisture, and require a plentiful supply of water at the roots during the summer months while in active growth. After their growth is completed the supply of water should be gradually lessened to induce the plants to rest. They must, however, never be subjected to excessive dryness.

The most common, and probably most convenient, method of propagation is by division of the crowns. This is best done in spring before active growth commences. The plants should

be shaken out and divided, the divisions being placed in a propagating-bed among sphagnum moss where they can have the benefit of a genial bottom-heat. They need to be syringed lightly two or three times a day, so that the moss is kept moderately moist.

As soon as they have made sufficient new roots they should be lifted with the moss adhering and potted up. An open fibrous compost is necessary; this may consist of fibrous loam peat, rough leaf-mold and a little sharp sand. We have sometimes seen sphagnum added to the compost, but this is only necessary when the loam and peat lack fibre and the compost is apt to be too retentive. In this, as well as in subsequent pottings, it is important to provide sufficient drainage and to fill the pots well up with the compost to avoid stagnation.

The varieties of Maranta are numerous and varied, ranging from a few inches to about three feet in height, and differing considerably in form of leaf, style of marking and variation of color. A few of the best varieties in general cultivation are M. Chimboracensis, M. Kerchoviana, M. capitata, M. Lindeni, M. Leitzei, M. media-picta, M. rosea-picta, M. virginalis major, M. exima, M. Veitchii, M. Wallisii discolor, M. Warscewiczii, M. Massangeana and the old, but indispensable, M. zebrina.

Tarrytown, N. Y. *William Scott.*

Ipomœa imperialis and Imperial Japanese are the dealers' names for some very charming new Morning-glories introduced this season. They appear to be selected hybrids, probably Ipomœa hederacea and some other large-flowering species. The leaves vary between three-lobed forms deeply cut to Ivy-leaved. In some varieties they have bright silvery variegations very clearly defined and attractive. This seems to be a novel feature in this strain. As some varieties have been named, we are enabled to make some notes as to the colorings, premising that they are all strong growers with thrifty foliage and produce freely flowers of the largest size and fine substance. Antigone has variegated leaves and blue flowers with a pink throat; Aglaia, with the same leaves, produces rich crimson flowers with a white throat; Aseria, with green leaves and flowers of most curious dull copper-red. Some of the plants supposed to be of this variety gave other eccentric colors, mostly dull mixtures of reds and blues difficult to describe. Ceres is very like Aglaia, but with a broad white margin to the carmine flowers. One of the most exquisite varieties is Euphrosyne, with variegated leaves and the purest white flowers with dainty pink throats. Other varieties have flowers of royal blue with white borders, and others still are light blue, ranging through the most delicate shades. The seeds of this strain germinate as readily as the ordinary Ipomœas, and, no doubt, they will prove a satisfactory addition to our long list of attractive climbers.

Elizabeth, N. J. *J. N. Gerard.*

The Golden Pocklington Grape.—I never knew the full value of this grape until the present season, when early ripening has brought it into perfect condition. It bears enormously heavy crops, and the fruit keeps in good condition for a long time. Its flowers are self-fertilizing, and they furnish abundant pollen for other varieties. The color of this grape is singularly beautiful, although its translucent yellowish white is rarely seen in perfection in the fruit as marketed. The bunch is large and finely formed; the berries are very large and never drop, nor do they decay and lose their flavor as soon as they are ripe. The flavor is slightly musky, but very rich. Best of all, it has a character which gives it a certain distinction among the many tame-flavored grapes.

Clinton, N. Y. *E. P. Powell.*

Correspondence.

The Palm-houses at Washington.

To the Editor of Garden and Forest:

Sir,—The low roofs of the Palm-houses in the Botanic Gardens and Agricultural Department at Washington have made it necessary to sacrifice many rare and beautiful specimens for lack of space. In nearly every case the plants were in the best of health and could only be duplicated by long patient years of cultivation. A few years ago a specimen of Livistonia Chinensis, at that time the largest in this country, had to be thrown out for lack of head-room. A fine specimen of Cocos butyracea was thrown out of the Palm-house of the Department of Agriculture for a similar reason. In the Botanic Gardens there are now three monarchs of the jungle awaiting their sentence. The first of these is a Phœnix sylvestris, a perfectly developed specimen fifty feet high, with a trunk six feet in circumference. It was sunk in the ground a few years ago, but has grown since until its leaves are now pressing against the roof of the house. It is considered the handsomest specimen of the species in cultivation. A noble specimen of the rare Sugar Palm, Arenga saccharifera, is the second plant which has outgrown the largest house, and has been kept within bounds by cutting off the ends of the leaves, in the hope that it would flower and ripen seed; but the plant is in too robust a condition, for this species begins to flower only when enfeebled by age or other trying conditions. It then begins to flower at the top and keeps on producing a bunch in the axil of each leaf one after another downward, until the plant is exhausted. This season one of the immense leaves has broken through the glass and now towers twenty feet above the roof outside. The third tree, which will soon have to be removed, is Acrocomia sclerocarpa. It is impossible to do anything more with this one, as several years ago it was sunk about six feet in the ground to give it increased head-room, and it has now filled all the space above.

Botanic Garden, Washington, D. C. *G. W. O.*

Lake Keuka Vineyards.

To the Editor of Garden and Forest:

Sir,—The grape crop of the lake region of central and western New York is considerably below the average this season, owing to the unexpected and unusual freeze of last May. The greatest damage was done in the Chautauqua district. There the yield this season is estimated at 12,000 tons, or, about one-half of last year's crop.

The grape crop of central New York—that is, of the vineyards of Keuka, Seneca, Canandaigua and Cayuga lakes—was estimated last year at 20,000 tons, whereas this season it is doubtful if there will be above 17,000 tons. It was expected that the decrease in yield would result in better prices, but thus far there has been no advance over last year, when the crop was large. About two cents a pound is received for Concords, and two and a half cents for Catawbas. The majority of grape-growers complain that there has been but little profit in the business during the past four or five years, due to overproduction. Some have pulled up their vines, burned their grape-posts for firewood, and are raising other crops on lands that a few years ago were bearing grapes.

The shores of Lake Keuka are well adapted for viticulture, owing to soil, climatic conditions and other natural advantages. The lake itself is a lovely sheet of water about twenty-four miles in length, with sixty miles of shore-line banked by rows of trellised Grapevines. Keuka is the Indian name for crooked, and Keuka Lake is shaped like the letter Y. At the base of the Y, in what is called Pleasant Valley, is the village of Hammondsport, now the headquarters of the wine-making industry, there being no less than eight wine cellars within a radius of ten miles. At the end of one of the arms of the Y is the thriving village of Penn Yan, from which more table grapes are shipped during the season than from any other place in the state.

The grape industry began along the shores of Lake Keuka almost fifty years ago. It is said that the first grapes grown out-of-doors which found their way to the New York City market were raised at Hammondsport, and were sent about 1850 by the way of the Erie Canal. The pioneer grower is said to have forwarded 200 pounds the next year, and the New York market broke under so heavy a shipment. About 1860, however, the Lake Keuka grape industry was fairly established, and it continued to prosper, so that in 1890, when the statistics of viticulture were collected for the first time in the United States, it was found that there were about 10,000 acres of vineyard in the lake country, or 15,000 acres in the entire district. In that year the crop amounted to 20,000 tons, or 40,000,000 pounds of table grapes, while 10,000,000 pounds were used by the wine-makers.

The surface of the Lake Keuka hillsides is gravel and shale on calcareous rock. The soil seems poor, and even weeds find no encouragement, but it produces the finest and sweetest Catawba grapes. The vines flourish in dry, loose gravelly, porous soil, where the air and warmth can penetrate to the roots. In early spring the crust of ice on the lake makes the air cold enough to retard the opening of the buds until the usual danger of frost has passed. In autumn the water exerts a similarly favorable influence by retaining summer's heat, and the warm breezes from its surface protect the fruit from early frosts in September. This difference in temperature is shown by the fact that vineyards a mile or two back from the lake do not do well, and are often ruined by cold waves or frosts.

The climatic conditions are favorable to the ripening of late

varieties of grapes. These are usually the best keepers, and the Lake Keuka grapes have thus a long range of season. The shipping season begins about September 1st, with early varieties such as Delaware, Moore's Early and Concord. Catawbas come into market about the first of October, and, now that the art of keeping them is understood, table grapes are shipped all through the winter months until March or April.

The methods of cultivation are about the same as in other vineyard districts, but the pruning is different from that in the Hudson River region, where the Kniffen system is used, and from that in the Chautauqua region, where the fan system is popular. In the Lake Keuka district the vines are pruned and trained by what is known as the "renewal system." Two main horizontal canes are trained permanently along the lower wires, one to the right, another to the left. New arms are formed every year. A few spurs are left near the centre of the vine, and shoots that come from the buds are used the next year. This system is the result of much experience, and seems best adapted to the Catawba vines, which grow straight up. At one time the Lake Keuka grape industry was threatened with ruin from black-rot, but the use of Bordeaux mixture has saved the vines.

Almost every person owning land along the lake has a vineyard. Farmers who do not make a specialty of grapes have vineyards of five or ten acres, while those who make a business of grape-growing maintain from thirty to forty acres, and expect to clear from $1,200 to $1,500 a year. There are some vineyards of seventy-five to a hundred acres. The largest along Keuka Lake are those of the Urbana Wine Company and the Keuka Vineyard, consisting of 125 and 110 acres, respectively.

Penn Yan, N. Y. *L. J. Vance.*

September Wild Flowers.

To the Editor of Garden and Forest:

Sir,—A recent drive around the head of Klinger Lake on a roadway through a marsh devoted to the cultivation of Peppermint introduced me to a varied flora as well as a grand display of fruits, which were often more showy than the flowers. Asters of various shades were in their prime, and among Golden-rods, too numerous to name separately, Solidago odorata and S. Riddellii were most rare. Gentiana saponaria is less beautiful than the famed Fringed Gentian, but the plants were fine specimens and interesting for their comparative rarity.

The Harebell, Campanula rotundifolia, was flourishing on sandy slopes in company with the Scouring Rush, as much at home, to all appearance, as when perched in the clefts of rocks through which water trickles.

The finest specimens of Rattlesnake-root, Prenanthus alba, I have ever seen were standing from four to five feet high, with the upper half of the stems covered with racemes of drooping flowers, forming a corymb of striking beauty in delicate tints of purple and pure white. The plant is certainly worth a place in parks and large grounds. The tall Coreopsis, C. tripteris, and several species of Bidens, of which B. chrysanthenoides was most noticeable, grew along a ditch, and the groups were charmingly brightened by Helianthus occidentalis, while the road-track was beautifully fringed with pink Polygonums of various species.

Through the shady woodland grew masses of Fern, and ripening fruits hung in many colors. Cornus florida showed its dark scarlet berries; C. stolonifera, its large clusters of white; the Alder, Alnus incana, its brilliant scarlet, as were also those of the Spicewood. The foliage of both species of Cornus was curled and faded, and we shall miss the soft tints so characteristic in later autumn. The change was due to a slight frost, perhaps, though no other signs of it were manifest. The Witch-hazel still held its seeds close in their green covering, waiting for the maturity which only comes with their fresh flowers in November, and the Hazels were loaded with their curiously wrapped nuts, to the joy of children and squirrels.

This locality is a rich field for the botanist at all seasons. In July, Zygadenus elegans was found along the stream, an uncommon plant here, with greenish flowers and narrow, almost grass-like, leaves. Not far away on the border of a smaller lake, in which the water has been unusually low this season, have sprung into bloom two Utricularias not seen there before. U. resupinata bloomed in July, while U. gibba, by some means belated, is now, September 25th, in full flower. I have the authority of Mr. C. F. Wheeler, of Michigan Agricultural College, for saying that "plants which flourish along sandy borders of lakes do not produce flowers when the water is high, but when favorable conditions appear they expend all their strength in producing flowers and seeds, the latter sometimes lying buried in sand for years until again exposed to light and the proper conditions of growth."

I have noted this season some plants not common in the locality, among them Baptisia leucantha, with erect growth of rigid stem sending out three branches and a raceme of white flowers.

It is to be regretted that several of the Orchis family, among them the white-fringed and yellow-fringed Orchis, have disappeared from the low land upon which they grew a few years ago.

White Pigeon, Mich. *Dorcas E. Collins.*

Recent Publications.

The English Flower Garden. By W. Robinson. John Murray, London; Charles Scribner's Sons, New York.

This is a new edition of the book which was first issued twelve years ago and took its place at once as a standard manual of garden plants and garden designs. It has been out of print for some time, and we are glad to make a note of its reappearance in an enlarged and improved form. The book is so well known that it is hardly necessary to describe it. The first part of it treats of garden designs in connection with the house and its surroundings, and shows in how many ways the different classes of hardy and half-hardy flowering plants in their infinite variety can be arranged so as to make the garden beautiful and present renewed attractions every day all the season through. Several simple, though tasteful, garden plans are mapped out and described, and on almost every page is an engraving of admirable quality to emphasize some lesson or hint at some practical combination or to set forth the beauty of some special flower or plant. The teaching in these two hundred and fifty pages is certainly in the right direction, and there is little doubt that the book has done much to relieve English gardens of stiffness and formality, to curtail what was once the prevalent practice of filling them with tender bedding-plants arranged in set patterns, and to make them natural in the best sense of the word—that is, suggestive of such combinations of form and color as nature presents in her happiest moods.

The second and larger part of the book is an alphabetical list of flowering herbaceous plants, shrubs, trees and climbers which can be used in English gardens, with brief descriptions of them and directions for their cultivation. This descriptive list is large, filling some six hundred pages, but even with so much space many plants must, of necessity, be omitted. Among the Syringas, for example, we see no mention of such well-known species as S. oblata, nor of more recent introductions like S. villosa or S. pubescens, which have proved themselves among the best of garden shrubs in this country. Some of the most interesting American and Asiatic species of Viburnum are not named. Several pages are devoted to the Clematis, with long lists of garden hybrids which can be used in various places, but, although our well-known C. coccinea is spoken of as a "remarkable and very distinct novelty," there is no mention of such species as C. paniculata, C. crispa and many others of the highest decorative value. A casual glance at the account of shrubs and of woody or half-shrubby climbers will detect many omissions which will surprise the American reader, some of them due to the fact, no doubt, that this class of plants does not flower as well in England as in our own drier climate, where the wood has a better chance to ripen. There is no doubt, however, that the list could be greatly improved by careful editing by some one who has an eye to perspective and appreciates the comparative value of plants, so that the reader will be able to apprehend more clearly the relative rank of different genera and of different species and varieties.

It is often said, and said with some truth, that the climate of England differs so widely from our own that cultural directions adapted to an English garden will have small value to Americans. The climatic differences of the two countries, however, are well known, and a little observation and practice will soon enable the American reader to make due allowances for the different conditions. The

book is, therefore, a useful one for any reader, and we repeat that all Americans who are interested in the refinements of gardening will be gratified to know that its beautiful and instructive pages have been reprinted.

Notes.

The Midland Railroad Company, in England, offered last spring prizes amounting to $1,000 for the best gardens at their various stations, and two hundred station-masters entered into the competition.

In Bulletin No. 34 of the Experiment Station of the Mississippi Agricultural and Mechanical College, S. M. Tracy and F. S. Earle print a list of fungi which have been found at different times in Mississippi. Of the 353 species in this list, fifty-five, or nearly one-sixth, are described as new to science.

The Lemon groves of California have this year given small fortunes to their owners. The growers have learned to cure the fruit so that it compares favorably with imported lemons and the crop is large. A correspondent of *The Tribune* writes that the product of groves planted ten years has amounted to as much as $3,600 an acre this year, of which at least one-half is profit. We apprehend that it must be a good grove and a good year to insure such results.

While vegetables have been destroyed by frost in some localities, peas continue to arrive from Long Island, and sell at fifty cents a half peck, and Lima beans of good quality bring thirty-five cents. Good corn may still be had for thirty-five cents a dozen. The last cucumbers come now from Shelter Island; these sell for five cents each, and the first hot-house cucumbers from Boston bring fifteen cents apiece. Lettuce and cauliflower are of good quality and reasonable in price, and tomatoes cost one dollar for a crate holding a bushel.

Number 1 of the first volume of the botanical series of the publications of the new Field Columbian Museum, at Chicago, is devoted to a contribution to the flora of Yucatan, by Charles Frederick Millspaugh, curator of the department of botany in the Museum. The collection which forms the basis of this paper was made in January of this year, during an expedition to the ruined city of Chichen Itza and the islands of Mugeres and Cozumel. The expedition was planned and carried out by Mr. Allison V. Armour, of Chicago, and was made in his steam yacht.

To the long list of hybrids raised by Monsieur V. Lemoine, of Nancy, must now be added Astilbe Lemoinei, obtained by crossing A. Thunbergii and A. (Spiræa) astilboides floribunda. The new hybrid, which is a plant of elegant and graceful habit, grows about twice as high as A. astilboides floribunda, and its period of flowering is intermediate between its parents. Monsieur Lemoine informs us that his new hybrid is not only perfectly hardy, but forces as easily and satisfactorily as the well-known A. Japonica, which, in his judgment, it surpasses from all points of view.

A special circular has been sent out by the New Jersey Experiment Station on the subject of Sulphur as a Preventive of Scab and Soil-rot in Potatoes. We alluded to Professor Halsted's experiments on the subject last week, and this circular, with the illustrations which show the advantages of this treatment in a striking way, is preliminary to a bulletin which is soon to be issued. The experiments give promise that the soil-rot, which has been very destructive to Sweet Potatoes in New Jersey, as well as the scab of Irish Potatoes, can now be controlled in a cheap way.

Of course, no fixed date can be named as the proper one for picking pears which are to be ripened in the house. To inquiries on this matter we can only say that a pear should be picked as soon as it easily separates from the branch when it is lifted. Messrs. Ellwanger & Barry, in reply to some inquiries on this subject, say that with them Anjou and Lawrence pears are picked as soon as they are full-grown, which is in that locality from the tenth to the fifteenth of October. They will shrivel if they are taken earlier. Winter Nelis, Duhamel, P. Barry, Josephine, Easter Beurre and other winter pears are better left until the latter part of October, unless heavy frosts occur, when they should, of course, be picked earlier.

Small lots of good peaches are still coming from Maryland, although the main crop from that state and from Delaware is past. Most of this fruit from northern New Jersey is small, owing to the extreme dry weather. Late Rareripes from the Hudson River district are among the highest-priced peaches now offered, with Keyport Whites and Salways from the same section. Selected fruits of these showy varieties sell for $2.50 a basket. Flame Tokay grapes from California, fully ripened, make a bright show on the fruit-stands with Black Moroccos, Cornichons and White Muscats. Coe's Golden Drop from California, and Italian prunes from Oregon, are among the latest shipments of this fruit. Lemons are gradually settling to ordinary prices, a fall of $2.00 a box having occurred during the past week, and limes, which a fortnight ago brought $18.00 to $20.00 a barrel, now cost but half as much.

A correspondent of *The Garden* speaks of the Rose La France as one of the best varieties for autumn flowering. We can add that in many gardens near this city this Rose makes a better display of flowers in autumn than in June. The outer petals are apt to turn brown early in the season, but when cool nights come the flowers are larger, more perfect in form and even more odorous, if possible, than at any other time. We have in mind a specimen plant of this Rose which has been standing out-of-doors now for six or seven years in a rather exposed position, and it is showing flowers by the dozen every day. Of course, water has been a necessity in this exceptionally dry year when there seems to be absolutely no moisture in the soil which can be reached by the roots of ordinary shrubs, but usually our autumn rains can be trusted to supply all the needs of the plant.

The *Agricultural Gazette*, of New South Wales, in speaking of the Colonial or Moreton Bay Pine, Araucaria Cunninghamii, states that in that colony it is the principal cheap soft-wood timber, and has taken the place of deal from Europe for packing-cases and other rough purposes. The timber goes under the name of white pine or Richmond River pine, and most of the planks show more or less of the figures similar to those in bird's-eye maple, so that in selected planks where these are numerous the wood is classed among ornamental timbers. On Richmond River the Colonial Pine grows to one hundred and fifty feet high, with a trunk four or five feet in diameter. When one of these trees decays in the forest a number of club-shaped pieces of wood, one or two feet long, and known as pine-knots, remain, owing their durability to the large percentage of resin they contain. Carters collect these knots and sell them for firewood, as they are considered much the best fuel in the district. It seems a pity, however, to put them to such a use, as the wood is of the most ornamental character, especially in longitudinal section. It is dark-colored, of various shades of brown, showing a most beautiful figure, and would be an ideal material for small articles of turnery. If this material were better known it might form the basis of a minor industry, much in the way that small articles are made of bog oak in Ireland. The substance turns like bone and comes polished from the tool.

In a bulletin on Cherries, prepared by Professor L. H. Bailey and his assistant, Mr. Powell, the cultivated tree Cherries are divided into two horticultural groups: (1) the Sour Cherries, derived from Prunus Cerasus, and characterized by a diffuse round-headed growth and a habit of suckering from the root, with flowers in small clusters from lateral buds, generally preceding the hard and stiff leaves, which narrow abruptly to a point, and roundish, red, soft-fleshed and sour fruit; and (2) the Sweet Cherries, supposed to be descended from P. Avium, of tall erect habit, bark tending to peel off in birch-like rings, flowers in dense clusters on lateral spurs, appearing with the more or less limp and gradually tapering leaves and variously colored, spherical or heart-shaped fruit, with flesh either soft or hard and generally sweet. The Sour Cherry class includes two types: the Amarelles, with pale red fruit, generally flattened at the ends, and with uncolored juice, and including Montmorency, Early Richmond and their kin, and the Morellos or Griottes, with very dark red fruits, generally varying from spherical to heart-shaped, and dark-colored juice, including the various Morellos, Ostheim, Louis Philippe and the like. The Sweet Cherry group is represented in this country by four types: the Mazzards, with small fruits, represented by miscellaneous inferior seedlings, and including the trees common along roadsides and wood-borders, where the seeds are scattered by the birds; Hearts or Geans, with a soft-fleshed, heart-shaped fruit, represented by Governor Wood, Black Eagle and Black Tartarian; Bigarreaus, hard-fleshed cherries, mostly light-colored and heart-shaped, including Windsor, Napoleon and Yellow Spanish; and the Dukes, which differ from the Heart cherries chiefly in having an acid or subacid fruit, and include the May Duke, Reine Hortense and Belle de Choisy and a few more.